Sustainable Infrastructure Plan for USACE Civil Works Infrastructure

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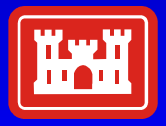
Foundational Directives

- **President's Management Agenda:**
  - **Item #6 – Asset Management**
- **Executive Order No. 13327:**
  - **Federal Real Property Asset Management (Feb 4, 2004)**
- **Civil Works Strategic Plan (FY04-09):**
  - **Goal 3: Infrastructure Modernization → Ensure project performance to meet authorized purposes and evolving conditions.**
- **USACE Campaign Plan:**
  - **Goal 3: Enhance life-cycle infrastructure management**
    - **Objective 3c: Improve the reliability of water resources infrastructure using a risk-based asset management strategy.**

Objectives

- Develop a comprehensive, overarching plan that:
  - Optimizes water resources infrastructure operating and maintenance investment decisions
  - Balances expected benefits against predicted costs and limited funding
  - Expands local and regional initiatives to nationwide initiatives
  - Applies a risk-based approach and focuses on rigorous asset management practices
  - Results in a recapitalization plan for water resources infrastructure



USACE Sustainable Infrastructure Plan

Key Assumptions:

- Aging infrastructure
- Requirements greater than resources
- Performance-based budgeting model continues
- Infrastructure security is critical to the Nation
- Stakeholders will accept more risk for aging infrastructure *if* they participate in the process

Justification:

- Public health and safety
- Demands of stakeholders
- Continued resource constraints
- Security environment
- Aging, increasingly obsolete infrastructure
- ASCE's 2005 Report Card for America's Infrastructure - D
- Impact from Hurricane Katrina

USACE SIP Along Business Lines

Federal Inventory:

- What do we own?
- Current condition?
- Remaining useful life?
- Consequences of failure
- Risk-based management
- Top 10 infrastructure requirements
- Communications Plan

Non-Federal Inventory:

- What has been completed?
- Current condition?
- Remaining useful life?
- Consequences of failure
- Risk-based management
  - Inspection of completed works
  - Recapitalization
- Top 10 infrastructure requirements
- Communications Plan

Water Resources Infrastructure

- **Federally owned and operated:**
  - **Locks and dams**
  - **Dams (flood control, recreation, etc.)**
  - **Environmental**
  - **Channels, disposal areas**
- **Federally constructed, non-federally owned and operated:**
  - **Levees, floodwalls, pumping stations, etc. (i.e. New Orleans)**
  - **Recreation areas**
  - **Environmental mitigation**
- **Non-federally constructed, owned, and operated:**
  - **Levees, floodwalls, etc.**
  - **Subject to PL 84-99 repair**

Aging Infrastructure (Federally Owned)

Aging Infrastructure (Non-federally Owned)

R&D Support to SIP

Focus Area:
NAVIGATION NETWORKS & ASSET MANAGEMENT

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Work Area:
ASSET MGMT & NETWORK SIMULATION

- **R&D support to ORNIM (ERDC & LRL technical collaboration).**
  - **Fatigue crack propagation modeling for steel hydraulic structures**
  - **AAR in massive concrete structures**
  - **Reliability of mechanical & electrical systems**
  - **Extension to coastal structures**
- **Identify and address R&D needs for ORNIM extension and application to other Corps navigation systems.**
- **Identify and address R&D needs for development and implementation of Corps-wide AM strategies.**
  - ***"USACE Asset Management Workshop for Civil Works Infrastructure",* August 2005, Alexandria, VA.**

Workshop Objectives

- Define asset management and metrics.
- Discuss current and future challenges related to asset management.
- Provide interagency forum for sharing lessons learned, partnering, and collaboration.
- Evaluate applicability of existing tools and data requirements for different business lines.
- Identify technical gaps and corresponding R&D requirements across business lines.

Workshop Participants

- USACE (HQ, Divisions, Districts, ERDC and IWR)
  - Civil Works Directorate (O&M, Homeland Security)
  - USACE Business Lines (Navigation, Flood Control and Storm Damage Reduction, Recreation, Hydropower).
  - Real Estate, Resource Management, Logistics
- Department of Interior (HQ)
  - U.S. Bureau of Reclamation
  - Bureau of Indian Affairs
- U.S. Navy
- NASA
- Academia:
  - University of Colorado at Boulder
  - University of Alabama's Center for Aging Infrastructure Systems
  - U.S. Military Academy
- National Science Foundation
- Federal Facilities Council

Asset Management

- As defined by the panel of experts and Workshop participants:
  - A way to manage resources that will maximize life-cycle performance, minimize risk, and optimize our infrastructure for the good of the Nation.
  - A proactive and sustainable approach to life- cycle planning, requisition, management and disposal.

What is Infrastructure?

- **As succinctly defined by Dr. David Hale (Director, University of Alabama - CAIS):**
  - ***"Large value service or product platforms that provide capabilities for others"***

Assets

- **Defined in four breakout sessions by participating USACE Business Lines.**
  - **NAVIGATION:** Locks and dams; channels, coastal structures (inlets and jetties).
  - **FLOOD CONTROL & STORM DAMAGE REDUCTION:** Dams, levees, flood walls, pumping stations, intake/outlet systems, beaches.
  - **HYDROPOWER:** Hydropower facilities (powerhouses, generators, turbines).
  - **RECREATION:** Recreational facilities (lakes, boat ramps, visitor centers).

Overall Top Five Challenges

- **Identified and prioritized by Workshop participants:**
  1. **Lack of standards and criteria**
  2. **Condition assessment**
  3. **Risk and uncertainty**
  4. **Business line processes**
  5. **Inadequate models and tools**

Top Challenges by Business Line

- **NAVIGATION:**
  1. Inventory (critical first step)
  2. Condition assessment
  3. Risk and uncertainty
  4. Standards (cross-cutting requirement)
  5. Models and decision-support tools
  6. Resources

- **FLOOD CONTROL:**
  1. Condition assessment
  2. Need for regional evaluation teams

- **HYDROPOWER:**
  1. Lack of hydropower strategic business plan/objectives
  2. Need buy-in for asset management
  3. Lack of start-up resources for implementation

- **RECREATION:**
  1. Scarce resources
  2. Safety
  3. Condition assessment
  4. Information technology rudimentary status and interoperability of models & data.

Top Priority Items

- Identified and prioritized by Workshop participants:
  1. Condition assessment
  2. Risk and uncertainty
  3. Regional evaluation teams
  4. Business lines specific consequences of not managing assets

Next Steps for Asset Management

- **Identified and prioritized by Workshop participants:**
  1. **Establish a National Asset Management PDT.**
     - **Business Line Managers**
     - **Regional Business Lines Members**
  2. **Develop a master or national plan for Asset Management based on strategic plans (i.e. USACE Campaign Plan, USACE Civil Works Plan, USACE Homeland Security Plan).**
  3. **Develop corporate and/or enterprise approaches for classification of assets and standards for condition assessment.**